REMARKS

Election/Restriction

The Examiner maintained the restriction requirement despite contrary arguments presented in a telephone call on May 17, 2005. As a result of this, the claims of Group II (Claims 7-13) have been cancelled without prejudice. Applicant reserves the right to pursue these claims in a divisional application.

Information Disclosure Statement

The Examiner observed that the references listed in the specification had not been presented in an Information Disclosure Statement. The most relevant of these references were formally disclosed in an Information Disclosure Statement filed on May 24, 2004. Another Information Disclosure Statement was filed on April 18, 2005.

Between the two disclosures mentioned above, all of the references listed in the specification have been formally disclosed, except for:

US 2,997,402
US 2,912,341
EP 0,763,392
US 4,897,294
US 4,430,121

which were not submitted as they were considered to be less relevant. For the sake of completeness, however, these references are formally disclosed in a further Information Disclosure Statement filed concurrently herewith.

Claim Rejections – 35 USC § 103

The Examiner rejected claims 1, 2 of 4-6 as obvious over Yamamoto (US 4,690,867) in view of Shea (US 2,698,256) and Callis (US 2,502,418).

It is to be noted that the present invention is concerned with the production of refractory materials that are intended to be brought into direct contact with molten aluminum or magnesium alloys and that can resist the damage that such alloys frequently do to conventional refractory materials. The refractories are unfired and include a calcium silicate-containing refractory as well as a barium- or strontium-containing compound.

The invention as claimed concerns the method of making a refractory component, which involves (a) forming a slurry comprising calcium silicate-containing refractory material and a barium- or strontium-containing compound, (b) placing the slurry in a mold, (c) dewatering the slurry to form the component, and (d) hydrothermally processing the component to form a final product. It is to be noted that the method requires the use of both calcium silicate-containing refractory and a barium- or strontium-containing compound.

Yamamoto is concerned with the production of a refractory for contacting low melting point metals, but does not mention problems caused by reaction of the metal with the refractory. Instead, Yamamoto is concerned with providing crack-resistance while avoiding the use of asbestos fibers. A double-layer structure is provided, with the metal-contacting part having no fibers or a reduced amount. The refractory has a xonotlite structure (fibrous crystals of aluminosilicate material) produced by introducing xonotlite slurry into the mixture.

The Examiner states that Yamamoto is silent regarding the use of a slurry comprising a barium- or strontium-containing compound and a drying step. The Examiner nevertheless finds the use of barium- or strontium-containing compounds in Shea and a drying step in Callis.

Shea relates to the production of light-weight heat-insulating materials of high strength. Again, there is no mention of problems caused by reaction of components of refractory materials with reactive metals and, indeed, Applicant believes that the type of light weight insulating refractory made by Shea is not used for contact with molten metal in a furnace, but rather in non-contact applications such as behind the contact bricks of a furnace to provide heat insulation for the furnace.

Shea discloses a very specialized procedure for greatly increasing the surface area of silica particles (e.g. silica flour, diatomaceous earth, etc.) and their reactivity to lime. A slurry of the particles is heated with an alkaline earth metal compound, which may be compounds of calcium, barium, magnesium or strontium (preferably lime). This forms an exterior coating on the silicate particles of a hydrous alkaline earth metal silicate compound. The hydrous alkaline earth metal silicate is then reacted with an acid to produce a compound or salt that is soluble in the acidified mixture, in water or in other solvent. The removal of the soluble

compound or salt results in the formation of a siliceous aggregate having a base substantially that of the starting material (the silica particles) provided with a reactive silica coating integrally bonded to the surface and interior surfaces of each particle. This renders the aggregate highly reactive, particularly toward calcareous binders of the type employed in the manufacture of siliceous-calcareous high-temperature insulation. Since the alkaline earth metal compound is dissolved and removed, the resulting aggregate contains substantially no alkaline earth compound (calcium, barium, magnesium or strontium) when the reactive aggregate is used to form a refractory material with a calcareous binder, such as lime. As noted in Shea, "Following acidification, it is the preferably practice to wash the resulting siliceous product until it is substantially free from acid *and soluble salts*" (emphasis added). Consequently, if a compound of barium or strontium is used in the method of Shea, it does not end up in the final refractory and it is used only in a transitory manner to increase the surface area and reactivity of the silica particles. Further confirmation of the removal of the alkaline earth compounds can be found in Column 4, lines 46 and 47, and in all of the independent claims.

If Shea could be combined with Yamamoto to produce a useful product (which is not clear because Yamamoto requires a special xonotlite structure), it would not result in the addition of a barium- or strontium-containing compound to Yamamoto, but would merely provide a reactive coating on silica particles used for the preparation of the refractory. Moreover, it is difficult to see the motivation of combining Shea and Yamamoto when Shea is trying to make a lightweight product and Yamamoto creates a dense refractory.

It should be pointed out that Shea mentions the use of alkaline earth compounds in combination with the reactive siliceous materials (Col. 3, lines 58 to 62), but only for the formation of cements with "better weathering characteristics and strength". Clearly, such cements are intended for outdoor applications rather than for the formation of refractories used in industrial settings, and cements are used for joining solid pieces, whereupon they are allowed to dry without any hydrothermal process. There is therefore no reason why a person skilled in the art would be encouraged to use such compounds in the formulations of Yamamoto. Also, alkaline earth compounds in general are referred to. There is no emphasis on the use of compounds of barium or strontium as such.

It is also mentioned in Column 6, at lines 45 to 49, that barium sulfate may be used as a pigment to color the face or surfaces of the final product, but there a person skilled in the art would not see a need to color a face of a refractory intended for contact with molten metal, and anyway the pigment is applied to the final product, rather than be used in the process of preparing the refractory.

Finally, it is noted that all the examples of Shea employ lime or magnesium oxide, so there is no specific emphasis of barium- or strontium-containing compounds.

As noted, Callis was cited to show a drying step. However, since Yamamoto and Shea are not believed to be relevant for the reasons given above, Callis adds nothing of significance. While it mentions drying (Col. 4, line 34), the product of Callis is different from that of the present invention (it relates to fibers bonded by a product of an alkali metal aluminate and an alkaline earth oxide), and there is no suggestion of a subsequent hydrothermal treatment (the blocks are dried by heating to elevated temperature – see Col. 3, lines 50 to 62). It is not seen that Callis is relevant at all.

Rejection of Claim 3

The Examiner rejected claim 3 as unpatentable over Shea in view of Lucas (GB 580,916).

Claim 3 is dependent on Claim 2 and ultimately on Claim 1. The claim is therefore believed to be patentable for the reasons given above.

In particular, Shea is not considered to be relevant for the reasons given. Lucas relates to a coating to be applied to a refractory, rather than to a refractory item itself and it is therefore difficult to see how it could be combined with Shea or Yamamoto.

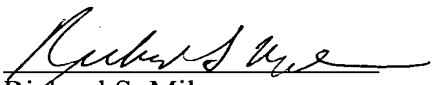
The Examiner made passing reference to Singer, but this does not seem to be a cited reference. Clarification would be appreciated if the rejection based on this reference is maintained.

In view of the above, favorable reconsideration of the invention is requested.

If a telephone interview would be of assistance in advancing prosecution of the subject applicants' undersigned attorneys, invite the Examiner to telephone at the number provided below.

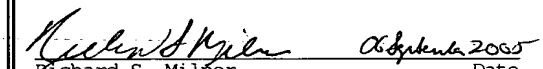
No fees are deemed necessary in connection with the filing of this Amendment. However, if any additional fees are required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,



Richard S. Milner
Registration No. 33,970
Christopher C. Dunham
Registration No. 22,031
Attorneys for Applicants
Cooper & Dunham LLP
1185 Avenue of the Americas
New York, New York 10036
(212) 278-0400

I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to:
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450



Richard S. Milner — Date
Reg. No. 33,970